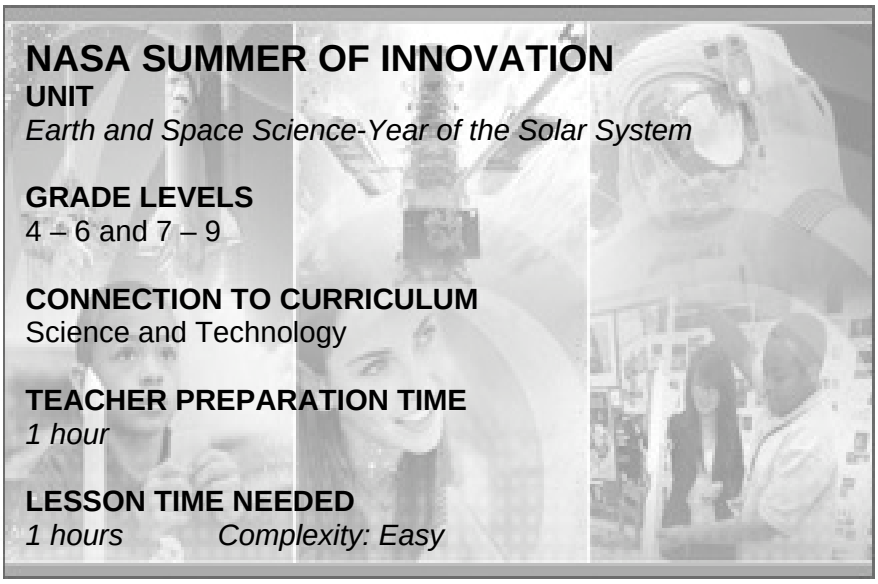
Solar System Missions

DESCRIPTION
This is a Web site containing an up-to-date comprehensive review of all planetary missions launched so far.

OBJECTIVES
Students will

- Investigate the historical and current planetary exploration missions
- Explore multimedia and formal and informal educational activities geared towards their grade level, interests, and ability



NASA SUMMER OF INNOVATION
UNIT
Earth and Space Science-Year of the Solar System

GRADE LEVELS
4 – 6 and 7 – 9

CONNECTION TO CURRICULUM
Science and Technology

TEACHER PREPARATION TIME
1 hour

LESSON TIME NEEDED
1 hours *Complexity: Easy*

NATIONAL STANDARDS

National Science Education Standards (NSTA)
Science and Technology

- Understanding about science and technology

History and Nature of Science

- Science as a human endeavor
- History of science

Earth and Space Science

- Earth in the solar system

ISTE NETS Performance Indicators for Students
Research and Information Fluency

- Evaluate and select information sources and digital tools based on the appropriateness to specific tasks.

MANAGEMENT
There is much information on this Web site that can be utilized while leading other activities dealing with the solar system. The following are instructions on navigating once in the Web site: go to the homepage, enter 1–6 Search Topics to broaden or narrow your search. Click on a letter at the top of the homepage to obtain information about spacecraft, their names starting with that letter of the alphabet. The menu on the left side of the homepage provides multimedia, educational activities, KIDS games, puzzles and activities, and background information.

CONTENT RESEARCH

Key Terms

MATERIALS
- *Computer with Internet access*

Solar System—The collection of planets and their moons in orbit around the Sun, together with smaller bodies such as asteroids, meteoroids, and comets.

Planet—A celestial body that is in orbit around the Sun, has sufficient mass to assume a round shape, and has cleared the neighborhood around its orbit.

Comet—A celestial object consisting of a nucleus of ice and dust and, when near the Sun, a "tail" of gas and dust particles pointing away from the Sun.

Sun—The star around which the Earth orbits.

Asteroids—A small rocky body orbiting the Sun. Large numbers of these, ranging in size from nearly 600 miles (1,000 km) across to dust particles, are found between the orbits of Mars and Jupiter.

Kuiper Belt—A disk-shaped region on the edge of the solar system that contains masses of ice and icy rock, believed to be the source of comets with orbital periods of less than 200 years.

Oort Cloud—A spherical cloud of small rocky and icy bodies postulated to orbit the Sun beyond the orbit of Pluto and up to 1.5 light years from the Sun, and to be the source of comets.

Key NASA Planetary Missions

All missions can be explored by planet here: http://solarsystem.nasa.gov/planets/index.cfm
Mission homepages are as follows:

- **Mercury-Messenger—**http://www.nasa.gov/mission_pages/messenger/main/index.html
- **Venus-Magellan—**http://www2.jpl.nasa.gov/magellan/
- **Mars-Mars Exploration Rovers, Mars Odyssey—**http://mars.jpl.nasa.gov/programmissions/missions/
- **Jupiter-Galileo—**http://solarsystem.nasa.gov/galileo/
- **Saturn-Cassini—**http://solarsystem.nasa.gov/missions/profile.cfm?MCode=Cassini
- **Uranus-Voyager 2—**http://solarsystem.nasa.gov/missions/profile.cfm?MCode=Voyager_2
- **Neptune-Voyager 2—**http://solarsystem.nasa.gov/planets/profile.cfm?Object=Neptune
- **Pluto (now considered to be a Dwarf Planet)-New Horizon—** http://solarsystem.nasa.gov/missions/profile.cfm?MCode=PKB
- **Asteroids-Dawn—**http://dawn.jpl.nasa.gov/
- **Comets-Stardust—**http://stardust.jpl.nasa.gov/home/index.html

LESSON ACTIVITIES

- Use the search engine on the homepage to find information about a particular planetary space mission.
- The multimedia section provides numerous short videos, sounds, and interactive activities for the students.
- Formal and informal education activities can be found in the Education section on the left side of the homepage.
- http://solarsystem.nasa.gov/missions/index.cfm

ADDITIONAL RESOURCES

- **JPL Education Page—**Formal and informal education resources, multimedia, and specific mission information. http://www.jpl.nasa.gov/education/index.cfm

- **Lunar and Planetary Institute—**A NASA-funded institute in Houston, Texas, devoted to studying the solar system and sharing the excitement of space exploration with the public. http://www.lpi.usra.edu/

DISCUSSION QUESTIONS

- What are two missions currently studying Mars*? Mars Exploration Rovers and Mars Odyssey*
- What major solar system body has still not been visited by a spacecraft? *Pluto*
- What was Project Viking? *A series of landers and orbiting spacecraft designed to study Mars.*
- What planetary missions will be launched in the near future*? Mars Science Lab and Juno*
- What will these missions explore? *Mars Science Lab-Mars and Juno-Jupiter*
- List five planetary mission spacecraft that were launched in the 1960s. *Mariners 2, 4, 5, 6, and 7*
- How many Voyager spacecraft were launched to the outer planets? *Two*
- What did the Voyager and Galileo missions have in common? *They both observed Jupiter*
- Give the names of at least two planetary missions to have been launched in the last 5 years. *Kepler and Dawn*

ASSESSMENT ACTIVITIES

- Challenge teams of students to learn five facts about a body of a solar system mission of their choice. Use the search engine on the homepage to find information about a particular planetary space mission. Have teams brief each other on what they learned. Each team can produce a travel brochure for their solar system mission.

ENRICHMENT

- Drive a Rover: Try your hand at driving rovers the way NASA does. http://www.marsquestonline.org/coolstuff/drivearover/index.html
- Pictures from Mars: Check out the latest pictures from the Mars Opportunity Mission. http://marsrovers.jpl.nasa.gov/gallery/all/opportunity.html
- Latest from Saturn: Explore the latest news and images from the Cassini Mission to Saturn. http://saturn.jpl.nasa.gov/index.cfm

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